SLOVENSKI STANDARD

SIST EN 62289:2003

december 2003

Video recording - Helical-scan digital video cassette recording format using 12,65 mm magnetic tape and incorporating MPEG-2 Compression - Format D-10 (IEC 62289:2002)

ICS 33.160.40

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EUROPEAN STANDARD **EN 62289**

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ICS 33.160.40

English version

Video recording – Helical-scan digital video cassette recording format using 12,65 mm magnetic tape and incorporating MPEG-2 compression – Format D-10

(IEC 62289:2002)

Enregistrement vidéo –
Format d'enregistrement à balayage hélicoïdal pour cassette vidéo numérique utilisant une bande magnétique de 12,65 mm avec système de compression MPEG-2 –
Format D-10
(CEI 62289:2002)

Videoaufzeichnung -
Videokassettensystem mit digitaler Schrägspuraufzeichnung auf Magnetband 12,65 mm und eingeschlossener MPEG-2-Kompression –
Format D-10
(IEC 62289:2002)

This European Standard was approved by CENELEC on 2003-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 62289:2003 E

Foreword

The text of the International Standard IEC 62289:2002, prepared by IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the formal vote and was approved by CENELEC as EN 62289 on 2003-03-01 without any modification.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-03-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes A, B, F and ZA are normative and annexes C; D and E informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62289:2002 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 61213	1993	Analogue audio recording on video tape - Polarity of magnetization	EN 61213	1994
IEC 61237-1	1994	Broadcast video tape recorders - Methods of measurement Part 1: Mechanical measurements	EN 61237-1	1994
ISO/IEC 13818-2	2001	Information technology - Generic coding of moving pictures and associated audio information: Video	-	-
ITU-R BT.601-5	- [1)]	Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios	-	-
SMPTE 12M	1999	Television, audio and film - Time and control code	-	-
SMPTE 259M	1997	Bit 4:2:2 component and 4 f_{sc} NTSC composite digital signals - Serial digital interface	-	-
SMPTE 305M	- [1)]	Television - Serial data transport interface	-	-
SMPTE 326M	- [1)]	SDTI content package format (SDTI-CP)	-	-
SMPTE 328M	- [1)]	MPEG-2 video elementary stream editing information	-	-
SMPTE 331M	- [1)]	Element and metadata definitions for the SDTI-CP	-	-
SMPTE RP 204	- [1)]	SDTI-CP MPEG decoder templates	-	-

1) Undated reference.

Publication	Year	Title	EN/HD	Year
AES3	- [1)]	Serial transmission format for two-channel linearly represented digital audio data	-	-

INTERNATIONAL STANDARD

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Video recording – Helical-scan digital video cassette recording format using 12,65 mm magnetic tape and incorporating MPEG-2 compression – Format D-10

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

VIDEO RECORDING – HELICAL-SCAN DIGITAL VIDEO CASSETTE RECORDING FORMAT USING 12,65 MM MAGNETIC TAPE AND INCORPORATING MPEG-2 COMPRESSION – FORMAT D-10

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62289 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

CDV	Report on voting
100/416A/CDV	100/481/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

VIDEO RECORDING – HELICAL-SCAN DIGITAL VIDEO CASSETTE RECORDING FORMAT USING 12,65 MM MAGNETIC TAPE AND INCORPORATING MPEG-2 COMPRESSION – FORMAT D-10

1 Scope

This standard specifies the formatting for the recording of data blocks containing MPEG-2 compressed video, multiple channels of AES3 audio and associated data which form helical records on 12,65 mm tape in cassettes. This standard also defines the helical track record parameters, the content and format of the longitudinal records and the cassette physical specifications.

The compressed video uses the MPEG-2 compression which is defined by ISO/IEC 13818-2 with constraints as defined by Annex F. The compressed video channel supports frame frequencies of 30/1,001 Hz (hereafter referred to as 525/60 system) and 25 Hz (hereafter referred to as 625/50 system).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61213:1993, *Analogue audio recording on video tape – Polarity of magnetization*

IEC 61237-1:1994, *Broadcast video tape recorders – Methods of measurement – Part 1: Mechanical measurements*

ISO/IEC 13818-2:2001, *Information technology – Generic coding of moving pictures and associated audio information: Video*

ITU-R BT.601-5, *Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios*

SMPTE 12M:1999, *Time and Control Code*

SMPTE 259M:1997, *10-Bit 4:2:2 Component and 4* f_{sc} *NTSC Composite Digital Signals – Serial Digital Interface*

SMPTE 305M, *Television - Serial Data Transport Interface*

SMPTE 326M, *SDTI Content Package Format (SDTI-CP)*

SMPTE 328M, *MPEG-2 Video Elementary Stream Editing Information*

SMPTE 331M, *Element and Metadata Definitions for the SDTI-CP*

SMPTE RP 204, *SDTI-CP MPEG Decoder Templates*

AES3-1992, *Serial transmission format for two-channel linearly represented digital audio data*

3 Abbreviations and acronyms

For the purposes of this standard, the following abbreviations and acronyms apply.

AUX: Auxiliary
CH: Channel
DCT: Discrete cosine transform
ECC: Error correcting code
EOB: End of block
I-NRZI: Interleaved non return to zero inverted
MUX Multiplex
SYNC: Synchronization
VLC: Variable length coding

4 Environment and test conditions

Tests and measurements made on the system to check the requirements of this standard shall be carried out under the following conditions:

– temperature: 20 °C ± 1 °C;
– relative humidity: 50 % ± 2 %;
– barometric pressure: from 86 kPa to 106 kPa;
– tape tension: 0,3 N ± 0,05 N;
– tape conditioning: not less than 24 h.

4.1 Calibration tape

Calibration tapes meeting the tolerances specified below should be made available by manufacturers of digital television tape recorders and players in accordance with this standard.

4.2 Record locations and dimensions

Geometrical location and dimensions of the recordings on the tape and their relative positions in regard to timing relations of the recorded signals shall be as specified in Figure 27 and Table 1. Tolerances shown in Table 1 should, however, be reduced by 50 % for calibration tapes.

5 Tape and cassette physical specifications

5.1 Magnetic tape specifications

5.1.1 Base

The base material shall be polyester or equivalent.

5.1.2 Tape width and width fluctuation

The tape width shall be 12,650 mm ± 0,01 mm. Tape width fluctuation shall not exceed 6 µm peak to peak. The value of tape width fluctuation shall be evaluated by measuring 10 points, each 20 mm apart, over a tape length of 200 mm.

5.1.3 Tape thickness

The tape thickness shall be from 12,3 μm to 14,5 μm.

5.1.4 Offset yield strength

The offset yield strength shall be greater than 15 N.

5.1.5 Magnetic coating

The magnetic tape shall have a coating of longitudinally oriented metal particles or equivalent. The coating coercivity shall be in the range of 118 000 A/m to 136 000 A/m, with an applied field of 800 000 A/m as measured by a 50 or a 60 Hz BH meter or a vibrating sample magnetometer (VSM).

5.2 Cassette specifications

5.2.1 Cassette dimensions

Two sizes of cassettes shall be identified as follows:

S-cassette:	96 mm x 156 mm x 25 mm	(as shown in Figures 1 to 13);
L-cassette:	145 mm x 254 mm x 25 mm	(as shown in Figures 14 to 26).

5.2.2 Tape length and recording time

Maximum tape length and recording time are recommended as follows:

S-cassette:	239 m $^{+2}_{0}$ m	60 min for 525/60	71 min for 625/50;
L-cassette:	725 m $^{+2}_{0}$ m	184 min for 525/60	220 min for 625/50.

5.2.3 Datum planes

Datum plane Z shall be determined by three datum areas A, B and C, as shown in Figures 3 and 16a. Datum plane X shall be orthogonal to datum plane Z and shall include the centres of datum holes (a) and (b) as shown in figures 2 and 15. Datum plane Y shall be orthogonal to both datum plane X and datum plane Z and shall include the centre of datum hole (a) as shown in Figures 2 and 15.

5.2.4 Tape winding

The magnetic coating side of the magnetic tape shall face outside on both the supply reel and the take-up reel as shown in Figures 4 and 17.

5.2.5 Label area and window area

The hatched areas shown in Figures 1 and 14 are for the label and window. Labels attached to the cassette shall not protrude above the outside cassette surface plane.

5.2.6 Guiding groove

For correct insertion into the VTR, four guiding grooves for S-cassettes as shown in Figures 1 and 2, and three guiding grooves for L-cassettes as shown in Figure 15 shall be provided.

5.2.7 Safety tab and safety plug for recording inhibition

For S-cassettes, a safety plug at the supply reel side and a hole of minimum depth 10 mm from datum plane Z at the take-up reel side shall be provided as shown in Figure 2.

For L-cassettes, a safety plug shall be provided at the take-up reel side as shown in Figure 15.

The safety plug shall not be deformed by 0,3 mm or more when a force of 2,0 N (204 gf) is applied to the centre of it, using a 2,5 mm diameter rod. See Figures 12 and 25.

5.2.8 Identification holes

Six identification holes (holes 1 to 6) shall be located as specified in Figures 2 and 15. For this format, holes 1, 2, 3 and 6 shall be closed. Holes 4 and 5 shall be open.

5.2.9 Reels

The reels shall be automatically unlocked when the cassette is inserted into the video tape recorder and/or player unit and automatically locked when the cassette is ejected from it.

The locations of the reels, when in the unlocked position, are shown in Figures 4 and 17. Dimensions of the reels are shown in Figures 6 and 19. Heights of the reels are shown in Figures 7 and 20.

The reel shall be completely released when the cassette lid is opened 23,5 mm minimum from datum plane Z.

5.2.9.1 Reel spring force

The reels assembled in the cassette shall be pressed by the reel spring with a specified force under the conditions specified in Figures 11 and 24. The spring force shall be 1,5 N ± 0,5 N (153 gf ± 51 gf) for S-cassettes and 3,5 N ± 0,5 N (357 gf ± 51 gf) for L-cassettes when pressing on a reel 2,4 mm above datum plane Z as shown in Figures 11 and 24.

5.2.9.2 Extraction force

The force (F1, F2) required to pull the tape out from the reel shall not exceed 0,17 N (17 gf), as specified in Figures 13a and 26a.

5.2.9.3 Friction torque

The torque required to wind the tape shall be less than 15 mN m (152 gf cm) for S-cassettes and less than 30 mN m (305 gf cm) for L-cassettes, as specified in Figures 13b and 26b.

5.2.10 Protecting lid

The cassette lid shall be automatically unlocked when the cassette is inserted into the video tape recorder and/or player unit and automatically locked when the cassette is ejected from it.

The unlocking lever insertion area is specified in Figures 8 and 21.

The lid shall be unlocked when the lid lock lever is shifted in either direction A or B, as illustrated in Figures 9 and 22. The force required to unlock the lid shall be less than 1 N (101 gf) in the A direction or less than 1,5 N (152 gf) in the B direction.

The lid shall open 29,0 mm with a force of 1,5 N (152 gf) or less as specified in Figures 10 and 23.